



Annual Excursion

AMELAND – CLIMATE CHANGE & ENERGY TRANSITION

Overview

Having met up at the ferry terminal in Friesland, we will set off on the ferry to Ameland together. After handling logistics, we bike to our accommodation, where the excursion leader, Joop Marquenie, will welcome everyone and kick off the evening lectures on NAM activities. This is followed by a lecture on Ameland and the Wadden Sea by Johan Krol. The evening ends with a relaxing social.

On Friday, Johan Krol will start with a lecture on subsidence monitoring and its correlation with sea level rise. Following that, we will mount our bikes to visit the island's NAM gas production facility. It is only possible to visit this plant during weekdays, which is the main reason for starting the excursion on Thursday.

On the way up or down to the plant, we will pass a salt marsh, called *Neerlands Reid*. We like to take you onto this marsh for some light field work. For those who do not know what a salt marsh is: it started as a sand flat on the Wadden Sea side and is growing with the sea level by accretion of clay. This clay layer forms an impermeable barrier; like a cap rock in gas and oil reservoirs. Underneath is sand and brackish or freshwater. This water lens may extend 40-60 meters. We found that water level is rising due to subsidence and sea level rise and is now – in winter and during spring tides – up against the clay cap. We will “drill” for water along a transect and see whether it is saline or fresh. The question we have for you is to do suggestions for the future, with ~60 cm of sea level rise.

Coming back to a buffet dinner offered to you by NAM, Dr Cees Laban will talk about the origin of the sand on Ameland; and how the whole of the North Sea is a story in itself. He will take us back to the ice ages and not only explain about the sands and glacial tilts, but also how countries collaborated in their research and making maps until oil and gas were discovered.

On Saturday, we will start with a lecture by Sjoerd van Til on the dynamicity of the Wadden Sea. We will then look into alternatives for the energy supply on Ameland and ask ourselves should it be ‘either-or’ or ‘both-and’? We have two special guest speakers from Ameland, Johan Kiewiet and Hans Overdiep, who will talk about the founding and success of the solar park and about the brand-new heat pump-gas hybrid heating system that is being tested on Ameland.

Programme

Thursday 7 September

- 19.30 Ferry departure ferry
- 20.15 Arrival Ameland, luggage transport by Kiewiet, bike rental, and biking to camp-house
- 20.30 Arrival at camp-house Elzenhoeve (Willibrordusst 2 in Buren)
- 20.30 Welcome and introduction
- 21.00 NAM (Joop Marquenie)
- 22.00 Ameland and Wadden Sea (Johan Krol)
- End Social

Friday 8 September

- 08.00 Breakfast (and preparation of lunch package)
- 09.00 Monitoring subsidence Ameland and the lessons with respect SLR (Johan Krol)
- 10.00 Coffee and departure by bike
Visit to the salt marshes and gas production site
- 17.30 Buffet dinner
- 18.30 Departure by bike for Wadden Sea excursion onto tidal flats
- 20.30 Bike to the museum in Nes
- 21.00 Our Pleistocene heritage and how to map it (Cees Laban)
- 22.00 How Ameland thought to be rich (Cees Laban)
- End Social

Saturday 9 September

- 08.00 Breakfast and dishes
- 09.00 Why the ferry is late so often: sand is still on the move (Sjoerd van Til)
- 10.00 Ameland solar plant: a dream came through (Johan Kiewiet)
- 11.00 Coffee
- 11.30 Hybrid heat-pumps: combining solar and gas (Hans Overdiep)
- 13.00 Lunch, pack, and clean the house.
- 15.00 Good-bye and return to ferry

Excursion background

Since 1986, natural gas is produced from a large gas field under the barrier island of Ameland. The field is situated under the east cape and produced by the Dutch joint-venture Nederlandse Aardolie Maatschappij (NAM; www.nam.nl). Due to the production and pressure drop, the sandstone layers from which the gas is produced at 3500 meter depth are compressed. Not much, but enough to cause the surface to subside (up to 40 cm until 2017). The subsidence has the form of a saucer, with a diameter of about 15 km. Since 1986, also the sea level has risen. According to a recent investigation, the rate of rise is 2,6 mm/yr since 1993 and 2 mm/yr before. This accumulates to 7.8 cm since production started. As a consequence, the relative sea level has risen by about 43 cm since the start of production 30 years ago. In terms of potential global sea level rise, this is a nightmare scenario.

Not aware of a future acceleration in sea level rise, a monitoring program was set up in 1986 to register in the finest detail the morphological and ecological responses of the nature in the nature conservation area. The international significance of the compiled data only became apparent after the year 2000, when the climate debate really started to become a hot issue. Monitoring is performed under the auspices of an independent technical committee, including representatives of NAM, the provincial nature conservation organization IFG, the council of Ameland, and involved ministries. The data and reports about the subsidence monitoring are publicly available through a Dutch website dealing with Wadden Sea issues (waddenloket.nl or waddenzee.nl). The website also contains a video explaining the process of subsidence and summaries in English of the main reports.

NAM is proud to share the information in the reports that its activities have generated, and its unexpected application to deal with sea level rise. For this reason, NAM supports excursions to familiarize participants with its activities and make wise use of these reports. This includes the interaction with activities of the Young Professional Coastal Community under EUCC (ypcc.eu). NAM excursions focus on several aspects of gas production in a sensitive environment and how to monitor these aspects. They also look into future sea level rise and how to make use of the instruments and knowledge that has emerged from the monitoring of subsidence. Every weekend, however, is unique. We like to match the group.